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**Datasheet for the decision
of 1 June 2022**

Case Number: T 0666/19 - 3.4.01

Application Number: 11743326.8

Publication Number: 2446706

IPC: H05B6/64

Language of the proceedings: EN

Title of invention:

MODAL ANALYSIS

Patent Proprietor:

Goji Limited

Opponents:

Fritsche, Rainer
Whirlpool Europe Srl Socio Unico

Headword:

RF Heater

Relevant legal provisions:

EPC Art. 54, 56, 83, 100(a), 100(b), 100(c), 123(2)
EPC R. 103(4)(c)

Keyword:

Sufficiency of disclosure - (no)

Amendments - added subject-matter (yes)

Novelty and inventive step - (no)

Decision in written procedure (yes) - announcement of non-attendance of the oral proceedings

Partial reimbursement of appeal fee at 25% - (yes)

Decisions cited:

T 0517/17, T 0202/18, T 0488/18



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Case Number: T 0666/19 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 1 June 2022

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Decision under appeal: **Interlocutory decision of the Opposition**
Division of the European Patent Office posted on

20 December 2018 concerning maintenance of the
European Patent No. 2446706 in amended form.

Composition of the Board:

Chairman P. Scriven
Members: A. Medeiros Gaspar
 C. Almberg

Summary of Facts and Submissions

- I. Two oppositions were filed, by opponent 1 (R. Fritsche) and opponent 2 (Whirlpool Europe), based on the grounds of Article 100(a), (b), and (c) EPC.

- II. The Opposition Division found the patent in the form according to auxiliary request 8, filed by the proprietor during oral proceedings, to meet the requirements of the EPC.

- III. Both the proprietor and opponent 1 appealed this decision.

- IV. Opponent 1 requests that the contested decision be set aside and that the patent be revoked.

- V. The proprietor requests that the decision be set aside and that the opposition be rejected, i.e. that the patent be maintained as granted (main request); or that the patent be maintained on the basis of one of auxiliary requests 1 to 9. Auxiliary requests 1 - 8 were submitted with the statement setting out the grounds of appeal, but are identical to those before the Opposition Division at the end of oral proceedings. Auxiliary request 9 was filed with the reply to the appeal of opponent 1.

VI. Document D2, in the numbering of the decision, was among those submitted as evidence:

D2 EP2051564 A1

VII. Claims 1 and 8 of the patent read:

1. An apparatus for applying electromagnetic energy at a frequency or frequencies in the frequency range of 1MHz to 100 GHz to an object (50) in a cavity (20) via at least one radiating element (18), the apparatus comprising:

a processor (30) configured to:

associate a first region and a second region in a cavity with respective first and second amounts of RF energy to be applied to the first and second regions, wherein the first amount of energy is different from the second amount of energy;

select, from multiple electromagnetic field patterns, a plurality of field patterns to target energy application to the first and second regions and regulate a source in order to apply, by exciting the selected field patterns in the cavity, the first amount of RF energy to the first region in the cavity and the second amount of RF energy to the second region in the cavity.

8. *A method for applying electromagnetic energy at a frequency or frequencies in the frequency range of 1MHz to 100 GHz to an object (50) in a cavity (20) using a source of electromagnetic energy regulated by a processor (30), the method comprising:*

assigning, by the processor, a first amount of energy to be applied to a first region and a second amount of energy to be applied to a second region; selecting, by the processor, from multiple electromagnetic field patterns, a plurality of field patterns to target energy application to the first and second regions; and regulating the source to apply, by exciting the selected field patterns in the cavity, the first amount of energy to the first regions and the second amount of energy to the second region, wherein the first amount of energy is different from the second amount of energy.

VIII. Claim 1 of the first auxiliary request add to claim 1 of the patent that the processor also determines the location of the regions. The relevant part of claim 1 reads:

*[...
a processor (30) configured to:]
determine locations of a first region and a second region in the cavity;
associate the first region and the second region in the cavity with the respective*

first and second amounts of energy to be applied to the first and second regions
...

- IX. Claim 1 of the second auxiliary request adds to claim 1 of the first auxiliary request:

*[...
determine locations ... cavity]
determine a first amount of energy to be applied to the first region and a second amount of energy to be applied to the second region, wherein the first amount of energy is different from the second amount of energy;
[associate the first region]*

- X. Claim 1 of the third auxiliary request differs from claim 1 of the patent by the following wording

[... select, from multiple electromagnetic field patterns, a plurality of field patterns to target] the first amount of energy to be applied to the first region and second amount of energy to be applied to the second region; [and regulate a source]

- XI. Claim 1 of the fourth auxiliary request adds, at the end of claim 1 of the patent:

[... second region in the cavity],

wherein the processor is configured to apply energy at frequencies that are smaller than four times the lowest resonant frequency supported by the energy application zone.

- XII. Claim 1 of the fifth auxiliary request amends claim 1 of the patent by replacing *at least one radiating element* by *a plurality of radiating elements*, and adds details as to how the field pattern is applied. The relevant parts read:

[... in a cavity (20) via] a plurality of radiating elements (18) for supplying electromagnetic waves to the cavity, [the apparatus comprising: ...

...

... to the second region in the cavity], wherein exciting the selected field pattern in the cavity comprises altering a phase difference between two electromagnetic waves supplied to the cavity.

- XIII. Claim 1 of the sixth auxiliary request differs from claim 1 of the patent by further comprising the feature:

[... to the second region in the cavity], wherein the processor is configured to apply energy over a plurality of phases, wherein an amount of energy applied is phase-dependent.

XIV. Claim 1 of the seventh auxiliary request differs from claim 1 of the patent by further comprising the feature:

*[... to the second region of the cavity],
wherein the processor (30) is configured to
apply energy to the first region and the
second region based on an indication of the
energy dissipated in each region.*

XV. Claim 1 of the eighth auxiliary request differs from claim 1 of the second auxiliary request, by further comprising the feature:

*[... to the second region of the cavity],
wherein the processor is configured to
apply energy only at frequencies that are
smaller than four times of a lowest
resonant frequency [sic] supported by the
cavity.*

XVI. Claim 1 of the ninth auxiliary request differs from claim 1 of associate the first region to the second region in the cavity with the respective first and second amounts of RF energy to be applied to the first and second regions.

XVII. Claim 8 of each of the auxiliary requests includes amendments corresponding to those of the corresponding claim 1.

- XVIII. Both notices of appeal also included conditional requests for oral proceedings, that were confirmed or concretized on the statements of grounds of appeal.
- XIX. The parties were summoned to oral proceedings.
- XX. In the accompanying preliminary opinion (Articles 15(1) and 17(2) RPBA 2020), the Board explained why it considered none of the claim requests to be allowable.
- XXI. Concretely, the Board was of the preliminary opinion that:
- (a) the invention as defined in the independent claims of each of the requests lacked sufficient disclosure;
 - (b) the independent claims of the patent as well as those of auxiliary requests 1 and 3-7 defined subject-matter extending beyond the content of the original application; and
 - (c) none of the requests defined subject-matter that was both new and inventive having regard to the disclosure of document D2.
- XXII. The relevant parts of the communication by the Board read:
- ...
- The invention as disclosed*
- 7. The invention relates to apparatuses, such as microwave ovens, and methods for applying electromagnetic energy to objects*

(to heat them).

8. It appears to be based on the recognition that, knowing the electromagnetic field patterns of the different modes supported by a cavity, a particular combination of such modes can be selected so as to target different amounts of energy to different regions of the cavity (see, for example, paragraphs [0039], [0042], and [0045] to [0047] of the patent).

Sufficiency of disclosure

9. The opponent argues that the skilled person is not provided sufficient information on how to apply a pre-defined first amount of RF energy to a first region and a second, different amount of RF energy to the second region of the cavity, since, without knowledge of the location and absorption properties of the object within the cavity, the microwave source cannot be regulated so as to guarantee said application.

10. The Board tends to agree with the Proprietor in that a limitation as to the amount of energy to be applied to a region cannot be equated to a limitation as to the amount of energy to be absorbed by an object in said region, but rather to a limitation as to the electromagnetic field pattern excited within the cavity.

Consequently, the Board also does not see the regions as necessarily being regions of the object.

11. However, the patent recognises that the electromagnetic field pattern excited within the cavity depends on the size, placement and properties of the object placed in the cavity (paragraph [0002]). Still, it proposes to target the application of different amounts of energy to different regions of the cavity, by selecting a particular combination of patterns determined for an empty cavity (see paragraphs [0094] and [0099] of the patent) and to regulate the source so as to apply those different amounts of energy to those regions of the cavity, by exciting said selected plurality of field patterns.

12. Since the actual electromagnetic field distributions excited in the cavity with an object will differ from those determined for an empty cavity, and the disclosure does not appear to teach how to determine or account for such differences, it does not appear possible to achieve, based on the disclosure, the above underlined results, which are explicitly mentioned in the claims.

13. In view of the above, the Board has doubts that the invention as defined in any of the requests is disclosed in a manner sufficiently clear and complete for it to be carried out by the skilled person.

Added subject-matter

14. Independent claims 1 and 8 of the patent include several amendments with regards to original independent claims 1 and 20.

15. The Board agrees with the opposition division in that the removal of the determination of the locations of a first and second regions within the cavity, as well as of determination of respective first and second amounts of energy to be applied, goes beyond the content of the application as filed.

16. It is true that, as the proprietor argues, by defining the association of two distinct regions in the cavity with two distinct amounts of energy, the claims require the pre-determination of those quantities.

17. However, by no longer including their respective determinations (nor even as reference to their pre-determination), the subject-matter covered extends to apparatuses and methods that, themselves, do not carry out such determinations, for which support cannot be found in paragraph [0004].

18. Opponent 1 also argues that the feature that replaced the above-mentioned determinations, defining an association (in claim 1) or an assignment (in claim 8) of

the different amounts of energy to the different regions, goes beyond the content of the application as filed, since no basis can be found in the original disclosure for a step of associating/assigning.

19. While agreeing that no literal basis exists for such associating/assigning terms, the Board considers the defined links to nevertheless result implicitly from the original disclosure (see e.g. paragraphs [0067], [0070], and [0073] to [0075] of the application as published).

20. To the contrary, the originally defined step of regulating the source, while requiring such links to have been pre-established, does not, in itself, provide basis for the introduction of this replacement feature.

21. In view of the opinions expressed above, the subject-matter of the independent claims of the main request extends beyond the content of the application as originally filed and the independent claims of auxiliary requests 1 and 3 to 7, prima facie, do not overcome these issues. To the contrary, the subject-matter of the independent claims of auxiliary requests 2 and 8 appears not to extend beyond the content of the original application.

...

Novelty and inventive step in view of D2

27. The Board sees the disclosure of paragraphs [0097],[0099], and [0104] - [0107] of document D2 as rendering claim 1 as granted not new.

28. Concretely, D2 discloses temperature measurements as being carried out in different defined portions of an object within a cavity (different regions of the cavity), with the aim of determining a spatial temperature distribution (paragraph [0106], see also figure 8(a)). It also discloses the selection, from among multiple electromagnetic field patterns (paragraph [0104]), of a plurality of field patterns to target the application of different amounts of energy to different portions of the object (paragraph [0105]), depending on their temperature, so as to obtain a more uniform heating of the object (paragraph [0107]).

29. The proprietor argues that document D2 does not disclose the association between the different regions and the different amounts of energy to be applied, or their determination.

30. However, such association results from the disclosure, in paragraph [0105] of the selection of the field patterns to be applied based on the heating state of the object (i.e. on the temperature of its different portions).

31. Therefore, the subject-matter of the independent claims of the patent lacks novelty in view of D2.

32. The proprietor also seems to argue that, in D2, no determination, of either the regions or the amounts of energy to be applied, is disclosed.

33. However, D2 does define a plurality of portions of the object (paragraph [0106]) as being those on which independent temperature measurements are carried out. It further results from the disclosure of region-specific temperature measurements and the of purpose of obtaining uniform heating, that regions specific target amounts of energy are defined.

34. Hence, also the independent claims of the auxiliary requests 1 to 3 appear to be not new in view of D2.

35. Additionally, in view of the fact that of D2 further discloses the modification of the field patterns as being effected by modifications of the phase difference between the microwaves radiated by two antennas (paragraph[0104]; see also paragraph [0090] and [0099]), the independent claims of auxiliary requests 5 and 6 also define subject-matter that is not new.

36. The same is true for the additional feature defined in auxiliary request 7,

given the disclosure of temperature determinations (a measure of the energy absorbed/dissipated) in paragraph [0106] of D2.

37. As to the further limitation, in auxiliary requests 4, 8, and 9, that energy is applied only at frequencies that are smaller than four times the lowest resonant frequency supported by the cavity, it is not disclosed in D2.

38. D2 does not disclose the dimensions of the cavity defined by case 501 in its figures. Whether, for the frequency band of 2400MHz to 2500MHz disclosed in D2 (paragraph [0046]), the modal condition is met can not be determined based on the disclosure of D2.

39. The Board is, however, of the opinion that the skilled person seeking to implement the teaching of of D2 would have employed a case such as those typically employed in microwave ovens (i.e. of linear dimensions of the order of 30-40cm).

40. In doing so, she would have implemented an apparatus that falls within the definition of claim 1 and a method within claim 8 of the auxiliary requests 4 and 8.

41. A combination of the disclosure of D2 with the disclosures of other prior art documents does not appear necessary for this conclusion.

42. Therefore document D2 prejudices the patentability of all the requests on file.

...

XXIII. Subsequent to the Board's communication, the proprietor indicated that *neither applicant/respondent Goji Limited nor their representatives will attend the Oral Proceedings ... in relation to this appeal* but made no substantive submission.

XXIV. Opponent 1 also made no substantive submission, but indicated who would attend the oral proceedings, "in case that oral proceedings will take place".

XXV. The oral proceedings were cancelled.

XXVI. Opponent 2 has made no submissions at all during these appeal proceedings.

Reasons for the Decision

1. The preliminary opinion, partly reproduced above, expressed and explained the Board's view that none of the requests on file was allowable.
2. Reference is made, in particular, to the following paragraphs reproduced above:

- (a) paragraphs 11 - 13 concerning sufficiency of disclosure (cf. Articles 83 and 100(b) EPC),
- (b) paragraphs 14 - 17 and 21 concerning added subject-matter (cf. Articles 100(c) and 123(2) EPC), and
- (c) paragraphs 27 - 42 concerning lack of novelty and inventive step having regard to the disclosure of D2 (cf. Articles 54, 56 and 100(a) EPC).

3. The proprietor has not commented on, let alone contested, this preliminary opinion.
4. After reconsideration, the Board does not see any reason to depart from it.
5. It is, then, concluded that none of the requests on file is allowable.
6. The proprietor's announcement that it would not attend oral proceedings is equivalent to a withdrawal of its request that oral proceedings be held (Case Law of the Boards of Appeal, 9th ed., III. C.4.3.2).
7. The Board understands opponent 1's request, in the statement of grounds, that a date be set for oral proceedings, in the context of its previous conditional request. This understanding is corroborated by the reference, in opponent 1's latest submission, to the possibility that the oral proceedings might not take place (item XXIV above).
8. This means that opponent 1 asks that a date be set for oral proceedings if the Opposition Division's decision is not set aside and the patent revoked. In view of the conclusion under point 4 above, this condition does not apply.

9. Consequently, oral proceedings were cancelled and the decision is issued on the basis of the parties written submissions.

10. Moreover, since the proprietor's withdrawal of its request for oral proceedings was made within one month of notification of the communication issued by the Board in preparation for the oral proceedings, both conditions of Rule 103(4)(c) EPC, that (with emphasis by the Board) *any request for oral proceedings is withdrawn ... and no oral proceedings take place*, are met; it makes no difference that only one of the appellants actively withdrew its request for oral proceedings. Consequently, each of the appeal fees is to be reimbursed at 25%. (cf. T 517/17, reason 6; T 202/18, reason 1; cf. T 488/18, reason 8).

Order

For these reasons it is decided that:

1. The decision is set aside.
2. The patent is revoked.
3. Both appeal fees are reimbursed at 25%.

The Registrar:

The Chair:



D. Meyfarth

P. Scriven

Decision electronically authenticated